

## X-RAY CATHETER WITH MINIATURE EMITTER AND FOCUSING CUP

### ABSTRACT

A cathode for a miniature X-ray device includes an insulating shell, a cathode and an anode. The cathode includes a focusing cup formed into an end. The focusing cup can include a thin metal layer that conforms to an inner surface of the cathode. An emitting material having a low work function, such as diamond, is deposited directly onto the internal surface of the focusing cup. The anode has a flat receiving surface for collecting electrons emitted from the anode. An interior coating is applied as a circumferential belt on the interior surface of the insulating shell. The interior coating, formed of a negative secondary emission yield material, extends lengthwise in the region of the cathode to an anode gap, covering the region of the insulating shell most likely to be subject to stray electrons emitted from the cathode.